

IN THE CLAIMS:

Please amend the claims as follows:

Claims 1-24 (cancelled).

Please add the following new Claims 25-49:

25. (new) A variable damper comprising;

an outer member including a magnetically conductive sleeve;

an inner member comprising a shaft; and

an electromagnet supported between the members;

wherein:

a chamber formed between the outer and inner members is at least partially filled with magnetorheological fluid (MRF), such that when a magnetic field is applied to the chamber, the effective viscosity of the fluid increases such that relative motion of the inner and outer members is opposed; and

characterized in that the electromagnet is supported in the chamber to provide a first fluid flow path between the outer member and electromagnet, and a second fluid flow path between the inner member and the electromagnet, the region between the electromagnet and the magnetically conductive sleeve defining a control region in the first fluid flow path in which the magnetic field is concentrated.

26. (new) A variable damper as claimed in Claim 25, wherein the outer member is located within a first housing.

27. (new) A variable damper as claimed in Claim 25, wherein the outer member comprises a first housing.

28. (new) A variable damper as claimed in Claim 25, wherein the electromagnet is supported on the outer member, such that the first fluid flow path is maintained between the outer member and the electromagnet.

29. (new) A variable damper as claimed in Claim 25, wherein the electromagnet is supported by a plurality of struts arranged perpendicular to the shaft.

30. (new) A variable damper as claimed in Claim 25, wherein the electromagnet is supported on the inner member.

31. (new) A variable damper as claimed in Claim 30, wherein the inner member comprises interconnected first and second shaft portions between which is arranged a second housing comprising the electromagnet.

32. (new) A variable damper as claimed in Claim 25, wherein a diaphragm seal portion is provided at each end of the shaft to bound the chamber.

33. (new) A variable damper as claimed in Claim 32, wherein the seal portion has an elasticity to allow the inner member to rotate in planes perpendicular to the seal portion.

34. (new) A variable damper as claimed in Claim 32, wherein the seal portion has an elasticity to reduce at least one degree of freedom of the relative motion of the inner and outer members.

35. (new) A variable damper as claimed in Claim 25, wherein the outer member includes a third housing at least at one body end surface, the/each third housing comprising a hollow cylindrical body including an aperture through which the shaft extends.

36. (new) A method of variably damping relative motion between an outer member including a magnetically conductive sleeve and an inner member, comprising the steps:

- (a) supporting an electromagnet between the members, such that a first flow path exists between the electromagnet and the sleeve, and a second flow path exists between the electromagnet and the inner member;
- (b) placing a magnetorheological fluid between the members;
- (c) applying a minimal magnetic field to the electromagnet;
- (d) increasing the magnetic field in the first flow path; and
- (e) increasing viscosity of the fluid to thereby oppose relative motion of the members and create damping with minimal off-state.

37. (new) A vibration control system for reducing vibrations comprising:

a first and a second element; and

a variable damper, located between the first and second elements, including an outer member including a magnetically conductive sleeve; an inner member comprising a shaft; and an electromagnet supported between the members, wherein a chamber formed between the outer and inner members is at least partially filled with magnetorheological fluid (MRF), such that when a magnetic field is applied to the chamber, the effective viscosity of the fluid increases such that relative motion of the inner and outer members is opposed and characterized in that the electromagnet is supported in the chamber to provide a first fluid flow path between the outer member and electromagnet, and a second fluid flow path between the inner member and the electromagnet, the region between the electromagnet and the magnetically conductive sleeve defining a control region in the first fluid flow path in which the magnetic field is concentrated, wherein the vibration control system causes active damping between the elements such that a relative figure of merit of less than 0.83.

38. (new) A vibration control system as claimed in Claim 37, wherein the relative figure of merit is less than or equal to 0.5.

39. (new) A vibration control system as claimed in Claim 36, wherein the shaft is connected to the first element and the housing is connected to the second element; and the system further comprises a spring located between elements; first and second accelerometers located between the variable damper and the respective first and second

elements; and a control unit for inputting accelerometer values and outputting a small electric current to the electromagnet, to cause active damping between the first and second elements.

40. (new) A vibration control system as claimed in Claim 36, wherein the inner and outer members of the damper are configured to be suitable for attachment to components of a device, such that an application of relative forces between components results in corresponding forces being applied to the inner and outer members of the damper.

41. (new) A vibration control system as claimed in Claim 40, wherein a parasitic power generator is incorporated with the device to provide the electric current that drives the electromagnet.

42. (new) A vibration control system as claimed in Claim 40, wherein the device comprises at least one sensor that detects a variable, a value of which can be used to determine a desired amount of electric current to be applied to the electromagnetic coil.

43. (new) A vibration control system as claimed in Claim 42, wherein an intelligent control unit (ICU) is provided, which is capable of receiving input signals from the sensors and outputting command signals to the damper, the command signals being derived from an algorithm used to determine a desired relationship between the input signals and the damping required.

44. (new) A vibration control system as claimed in Claim 43, wherein the device is a snowboard, one of the outer member and inner member of the damper is attached to a surface board, and the other of the inner member an outer member is attached to a raised portion formed on the snowboard.

45. (new) A vibration control system as claimed in Claim 44, wherein a plurality of dampers are attached to the snowboard.

46. (new) A vibration control system as claimed in Claim 45, wherein torsion forks are provided on the snowboard and connected to the inner member of the device to enable control of torsional stiffness of the snowboard.

47. (new) A vibration control system as claimed in Claim 43, wherein the device is a golf club, one of the outer member and inner member of the damper is attached to a shaft of the golf club, and the other of the inner member and outer member is operatively associated with a grip of the club.

48. (new) A vibration control system as claimed in Claim 43, wherein the device is a handle which is a component of a machine, wherein the machine is selected from a group consisting of: a tennis racket, polo mallet, sports implement, a household tool, a power drill, a bicycle, a motorcycle, and like machines.

49. (new) A vibration control system as claimed in Claim 43, wherein the device is selected from the group consisting of an engine mount, pump mount, and the like.